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E.O. 12958: N/A
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SUBJECT: RUSSIAN NANO COMPANIES LEAVE ACADEMY BEHIND

REF: 06 MOSCOW 12192

1. (SBU) Summary: EST recently visited two nanotech ventures based in Moscow-region "science cities." The scientists who head these entities reinvented themselves after the fall of the Soviet Union. In the process, they have provided a new model for Russia science, one centered on an extremely disciplined enterprise whose management is focused on an area that rarely captures the attention of Russian scientists -- the bottom line. Zelenograd's NT-MDT is a private company with strong ties to federal and regional officials. The Institute of Superhard and Novel Carbon Materials (ISNCM) in Troitsk generates millions in annual revenue and is funded partially by the Federal Agency for Science and Innovations. Not coincidentally, neither entity is affiliated with the Russian Academy of Sciences (RAS). End summary.

The Bottom Line

2. (SBU) EST visited NT-MDT, a nanotech firm based in the former closed city of Zelenograd, on March 6 to discuss the company's activities and its perspective on GOR efforts to stimulate the development of nanotech in Russia. NT-MDT was established in 1989 by Dr. Viktor Bykov in cooperation with two other scientists. The company was transformed into a commercial enterprise in 1993, focused on the development of nano-instruments. Boasting a staff of more than 250 -- including representatives in Western Europe -- NT-MDT is planning to launch an IPO in 2011. Dr. Bykov and his son Aleksander (the latter is now the company's CEO) provided EST with an overview of the company's evolution from a small firm to one whose products meet international standards and hold European Union certificates. NT-MDT manufactures "big tools" such as nano-microscopes. The firm's clients include institutes under the Russian Academy of Sciences (RAS) and universities across Russia, as well as European and American companies.

3. (SBU) Bykov credits his success to the company's market-based philosophy. NT-MDT ferrets out information about the needs of clients (and potential clients) and directs its research efforts towards meeting those needs. According to Bykov, the main difference between his approach and that of RAS scientists is how he defined success: a concept that can travel from the theoretical to production to sale, rather than a paper published in a journal. Noting his single-minded focus on commercializing a concept, Bykov stated that NT-MDT invests 20 percent of its budget into R&D, which is two or three times the Russian average.

14. (SBU) Likewise, Troitsk's ISNCM invests heavily in R&D. Its Director, Dr. Vladimir Blank, said that while the institute did not treat R&D as a special budget category, of its nine million dollars in 2006 revenue, 2.4 million was allocated for salaries, two million for maintaining and modifying existing equipment, \$200,000 for staff participation in international conferences ("very important") and the remainder for designing, building and/or buying new equipment -- which he considers critical to remain competitive. Blank said he regards Russian-made high-tech instruments as generally of mediocre quality, thanks to "15 years of problems." ISNCM imports most of the equipment it uses from U.S. and Western Europe and claimed to have had "no problems" with either U.S. export controls or Russian customs importing such instruments.

15. (SBU) Like NT-MDT, ISNCM has produced healthy profits despite initial skepticism from RAS leadership. As EST learned during a March 21 visit, twelve years ago Blank was told by RAS management that the Academy would no longer pursue research into super-hard materials; his funding would be eliminated. Dr. Boris Saltikov, then Minister of Science, believed in Blank's work and recommended that he break with the RAS and create his own institute, which Saltikov vowed to support. Blank established the ISNCM under the aegis of the Federal Agency for Science and Innovations, more commonly known as "Rosnauka." Since then, Rosnauka has funneled millions of dollars into ISNCM's research. Last year, Rosnauka provided one million dollars and ISNCM turned a profit of nine million dollars, belying the RAS's earlier disdain for Blank's research.

16. (SBU) ISNCM produces lenses for lasers and microscopes and materials for semi-conductors created from artificial diamonds. With a permanent staff of 160 and between 40 and 50 contractors, ISNCM's foreign clients include the Massachusetts Institute of

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Technology, the National Institute of Standards and Technology and Germany's Max Planck Institute. In 2006, ISNCM sold three atomic-force microscopes to U.S. customers; this year, it has already sold between 10 and 12. Most of ISNCM's clients are from the U.S., Japan and Europe, while business with China remains minimal. Echoing what others have previously told EST, Blank said the Chinese are interested in purchasing ISNCM's technology and processes rather than its products. "It's a very strange situation," Blank observed, adding later that China is a "dangerous country."

Young Minds

17. (SBU) As a Professor at the Dolgoprudniy Physical Technical Institute, Bykov uses his position to aggressively recruit promising young researchers and graduate students on a contract basis, essentially replacing the RAS institutes as a training ground. He characterized the students' work as a sort of for-profit internship, benefiting both NT-MDT and the students, who supplement their meager RAS stipends with a more bountiful salary from the private sector. Bykov said that the quality of students is better than ten years ago, though not as strong as during the Soviet era. In terms of IPR, the company's policies are clear-cut: NT-MDT owns the patent to any product created by a full-time employee. It shares the patent with a scientist if that researcher is based elsewhere and is performing part-time contract work with the company.

18. (SBU) ISNCM has also had great success in attracting and retaining young scientists. The Institute's average salary is \$950 a month, with laboratory chiefs earning \$2000. Blank noted that the cost of living is less than half of that in Moscow. In addition, ISNCM has received special grants from the Ministry of Finance to provide free housing to all of its scientists under the age of 35. Since its creation 12 years ago, not a single scientist has left ISNCM, according to Blank. Blank credited ISNCM's cutting edge work, state-of-the-art equipment and the opportunity to attend international conferences as part of the institute's attraction for young scientists. Indeed, during a tour of the Institute only a handful of staff appeared to be older than 35.

Friends in High Places

¶9. (SBU) Meanwhile, NT-MDT has received "not bad support" from Government programs, totaling approximately 400 million rubles (over \$14.5 million) over the last three years, according to Bykov. Such a sum is due to NT-MDT's deep knowledge of nano-materials and the firm's "good contacts," he said. (Note: NT-MDT has been approved as one of the first resident companies in the Zelenograd Special Economic Zone (SEZ), for which the Agency for Management of Special Economic Zones has budgeted almost \$800 million for infrastructure development over the next five years. End note.) Indeed, Bykov referenced his close ties to Dr. Sergey Mazurenko, head of Rosnauka. ISNCM's Blank noted his connections to Mazurenko as well. Rosnauka recently awarded a 12 million dollar grant to ISNCM that will be disbursed over a three-year period.

¶10. (SBU) Bykov also mentioned his "good friend" Ivan Bortnik, the head of the Russian Foundation for Assistance to Small Innovative Enterprises (FASIE). Bykov now sits on FASIE juries and judges grant applications. Both Blank and Bykov have close ties to Dr. Mikhail Alfimov, who heads the experts committee advising the GOR taskforce on nanotech. Alfimov, with whom Bykov has been friends since 1977 when they attended the same institute, has invited Bykov to join the expert committee as well. Bykov judged the GOR program to be both ambitious and "hard to implement." The most promising areas for nano's development in Russia include the nano-dispersion of drugs, according to Bykov. NT-MDT is cooperating with laboratories under the purview of the Russian Academy of Medical Sciences (RAMS) and the Ministry of Health to develop instruments for such research.

Why Nano? Why Now?

¶11. (SBU) When asked why the GOR is suddenly so interested in nanotech's possibilities, Bykov noted that Russia's old production

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capabilities have literally fallen apart and have lost any tenuous connection to market demand that they once might have had. The Kremlin is trying to predict what areas present the greatest potential for development and revenue. According to Bykov, nano is the natural choice. "Nanotech will meet modern needs. Nano is the future," he stated. He critiqued the approach of Dr. Mikhail Ananyan, head of competitor Nanoindustriya. Ananyan, Bykov said, is lost in his "personal fantasies" and unable to focus on the market's needs. Whereas Ananyan argues that the Kremlin has tasked the wrong Ministry with oversight for the GOR nanotech program, Bykov believes that the issue of who heads it is insignificant. Bykov professed not to know Aleksander Khlunov, the Ministry of Education and Science (MES) official designated by the Kremlin as the GOR Working Group's secretary. He mentioned NT-MDT's ties to Deputy MES Minister Dmitriy Livanov, however, and noted Livanov's February 22 election as Rector of the Moscow Institute of Steel and Alloys, an institute which is a key NT-MDT client. (Note: Blank told us that Livanov will soon leave the MES to take up his new post as Rector full-time. Blank also said he was scheduled to meet with Khlunov later that day. End note.)

¶12. (SBU) Like Bykov, Blank believes that the GOR is sincere in its interest in supporting nanotech's development. However, he argued that there are few individuals or organizations within Russia that have real nano expertise. "Everyone is new to it," Blank observed. GOR funding for nano has only been at "serious levels" for the last year or two. In order to illustrate how the standard bearers of Russian science have been more reactive than proactive when it comes to nanotech innovation, Blank shared an anecdote about how ISNCM obtained a new atomic microscope. Two years ago, Blank told Mazurenko that ISNCM's work was hindered by the lack of this microscope. Mazurenko agreed to fund its procurement, at which point RAS institutes and ones affiliated with the Federal Agency for Atomic Energy (Rosatom) complained loudly that they also did not

have such a microscope. Rubles were allocated and microscopes purchased. The implication is that, absent Blank's activism, the RAS and Rosatom institutes would still be without this vital piece of equipment.

Comment: Academy Who?

¶13. (SBU) As both NT-MDT and ISNCM demonstrate, working outside the system of RAS institutes need not hinder a venture's progress. Both entities have parlayed government support into profitable -- and self-sustaining -- projects, providing useful evidence for MES officials in their crusade to focus RAS scientists on meeting market demand. Both have provided the three necessities to their young staff: relevant work, the latest equipment, and sufficient financial incentives, in the form of livable wages and housing. Russian officials are betting on nanotechnology as the field with the most promise for Russian science. Scientists would do well to bet on the NT-MDT/ISNCM paradigm as the model with the best chance for success.

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